

# PATENT COOPERATION TREATY

# PCT

## INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference <b>9-16791-1PCT</b>	<b>FOR FURTHER ACTION</b> see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. <b>PCT/CA 03/01683</b>	International filing date (day/month/year) <b>03/11/2003</b>	(Earliest) Priority Date (day/month/year)
Applicant  <b>VLN ADVANCED TECHNOLOGIES INC.</b>		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 5 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

**1. Basis of the report**

a. With regard to the language, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

b. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international search was carried out on the basis of the sequence listing:

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

2. ☐ Certain claims were found unsearchable (See Box I).

3. ☐ Unity of invention is lacking (see Box II).

4. With regard to the title,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the abstract,

☐ the text is approved as submitted by the applicant.

☒ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the drawings to be published with the abstract is Figure No.

☒ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

1

☐ None of the figures.

## INTERNATIONAL SEARCH REPORT

International application No.:

PCT/CA 03/01683

### Box III TEXT OF THE ABSTRACT (Continuation of Item 5 of the first sheet)

An ultrasonic waterjet apparatus(10) has a mobile generator module(20) and a high-pressure water hose(40) for delivering high-pressure water from the mobile generator module(20) to a hand-held gun(50) with a trigger and an ultrasonic nozzle(60). An ultrasonic generator in the mobile generator module(20) transmits high-frequency electrical pulses to a piezoelectric or magnetostrictive transducer(62) which vibrates to modulate a high-pressure waterjet flowing through the nozzle(60). The waterjet exiting the ultrasonic nozzle(60) is pulsed into mini slugs of water, each of which imparts a waterhammer pressure on a target surface. The ultrasonic waterjet apparatus(10) may be used to cut and de-burr materials, to clean and de-coat surfaces, and to break rocks. The ultrasonic waterjet apparatus(10) performs these tasks with much greater efficiency than conventional continuous-flow waterjet systems because of the repetitive waterhammer effect. A nozzle with multiple exit orifices or a rotating nozzle(76) may be provided in lieu of a nozzle with a single exit orifice to render cleaning and de-coating large surfaces more efficient. A water dump valve(27) and controlling solenoid are located in the mobile generator module(20) rather than the gun(50) to make the gun lighter and more ergonomic.

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International Application No

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## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 B08B3/02 B05B3/04 B05B12/06

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 B63B B26D B05B B08B E21B B24C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	VIJAY, M.M: "Design and development of a prototype pulsed water jet machine for the removal of hard coatings" PROC. 14TH INTERNATIONAL CONFERENCE ON JETTING TECHNOLOGY BHR GROUP CONFERENCE SERIES, no. 32, 1998, pages 39-57, XP009034788 LONDON page 39 - page 41; figures 1-4	1,2,6, 10, 13-15, 18,27, 40,41, 44,45,48
Y A		36 7-9,33
Y A	US 4 821 961 A (SHOOK FORREST A) 18 April 1989 (1989-04-18) column 1, line 66 - column 3, line 3; figures 1-5	36 19-23, 37,38, 42,46
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☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

### \* Special categories of cited documents:

- \*A\* document defining the general state of the art which is not considered to be of particular relevance
- \*E\* earlier document but published on or after the international filing date
- \*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- \*O\* document referring to an oral disclosure, use, exhibition or other means
- \*P\* document published prior to the international filing date but later than the priority date claimed

- \*T\* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- \*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- \*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- \*G\* document member of the same patent family

Date of the actual completion of the international search

4 August 2004

Date of mailing of the international search report

11/08/2004

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# INTERNATIONAL SEARCH REPORT

International Application No

PCT/CA 03/01683

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 3 373 752 A (KIYOSHI INOUE) 19 March 1968 (1968-03-19) column 3, line 15 - column 5, line 25; figures 1-5	4, 5, 12
A	EP 0 829 311 A (TOKYO SHIBAURA ELECTRIC CO) 18 March 1998 (1998-03-18) column 7, line 20 - line 39 column 9, line 33 - column 10, line 17; figures 1,5,7,10	9, 20, 21, 23
A	EP 1 016 469 A (SCHNEIDER LUFTDRUCK GMBH) 5 July 2000 (2000-07-05) column 2, line 42 - column 3, line 30; figures 1-3	19-21, 25
A	US 5 725 680 A (MATHIEUS GEORGE J) 10 March 1998 (1998-03-10) column 5, line 44 - line 61; figures 1,4	24-26
A	GB 955 405 A (EXXON RESEARCH ENGINEERING CO) 15 April 1964 (1964-04-15) page 3, line 18 - page 4, line 18; figures 1,2	1, 40
A	US 5 154 347 A (VIJAY MOHAN M) 13 October 1992 (1992-10-13) cited in the application column 3, line 29 - column 6, line 68	1, 40

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/CA 03/01683

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